

20<sup>th</sup> April

### Memory verses

Of old hast thou laid the foundation of the earth:  
and the heavens are the work of thy hands.  
They shall perish,  
but **thou shalt endure**:  
yea, all of them shall wax old like a garment;  
as a vesture shalt thou change them,  
and they shall be changed.

Psalm 102:25-6

Make sure you know the meaning of the words in pink.

### Something to think about – Comets

Constellations of stars are not the only interesting thing you can see if you are watching the night sky. You might see a comet, for instance. Do you remember reading about Halley's comet in the lesson for 9<sup>th</sup> February?

You will recall that Edmund Halley (1656-1742) reasoned that the comet which had been sighted in 1531, 1607 and in 1682 (when Halley himself saw it) was in fact the *same object* and would continue to be seen at regular intervals. He predicted that it would return again in 1758. Before this time people thought comets were celestial objects that appeared either for no knowable reason or related to important events on earth. Halley died sixteen years before he could witness the return of the comet but when it appeared on time in 1758 he became posthumously famous. Halley's observation made it possible to look at the records of sightings of comets through history and calculate which comets they were.

On 20<sup>th</sup> April Halley's comet was seen in China as long ago as 295AD – although, of course, no one called it “Halley's” comet then and they had no idea that it would reappear in a regular pattern.<sup>1</sup> The comet is due to appear again in 2062. I will certainly not be here then but you may be!

Halley's Comet is a periodic comet and Halley's discovery shows us part of the orderliness of God's design of the universe. Periodic comets like Halley's help us to think about our mortality and about the fact that one day, just as God created the heaven and the earth he will change them and there will be a new heaven and a new earth. We can read about this in the Bible in Isaiah 65:17 and Revelation 21:1 as well as in our memory verses.

Also on 20<sup>th</sup> April in 1702 the comet known now just as “C/1702 H1” or “the comet of 1702” was discovered by Francesco Bianchini and Giacomo Filippo Maraldi. This is a non periodic comet which, as it is not orbiting the sun, may never appear again.

### Something to draw or design

If you have a piece of black paper and some sticker stars or silver pens you can make a night sky picture with a comet in it. You can use a sticker star for the “head” of the comet (which is really made of dust, rock and ice) and draw the tail (gasses) with silver pens. If you have only white paper and ordinary pens and pencils you can still draw a starry sky with a comet in it.



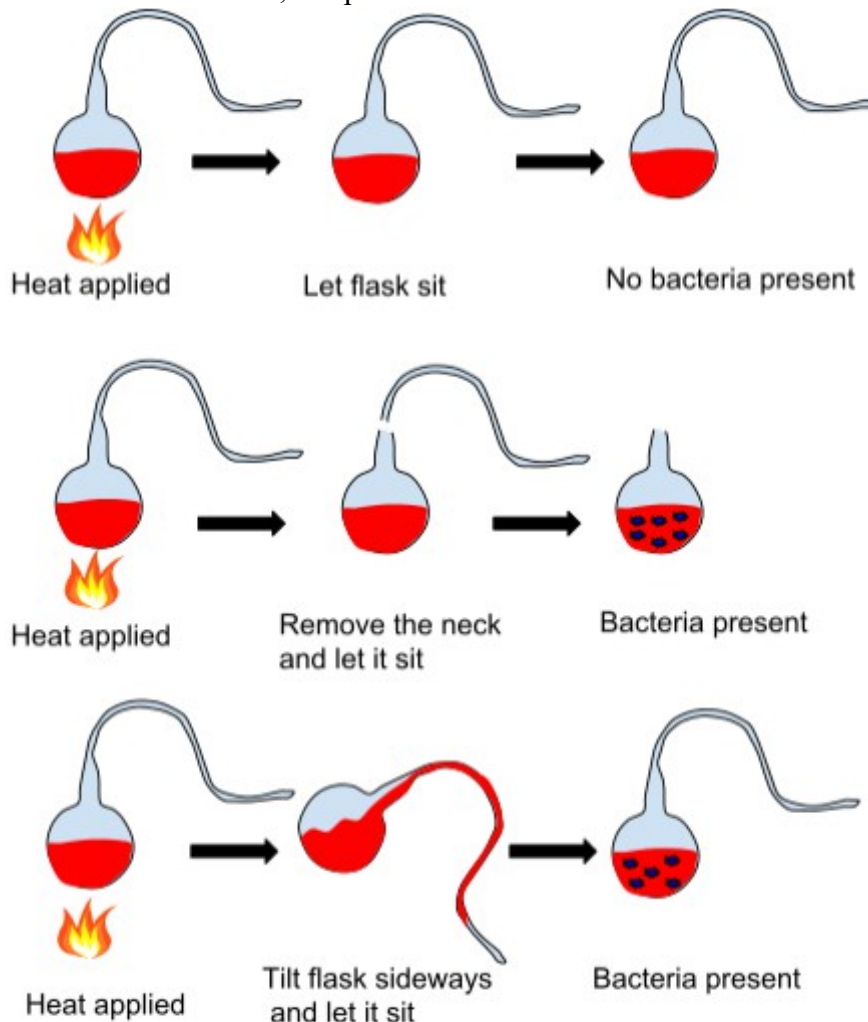
<sup>1</sup> If you want to read about Halley's comet there is a good article here: <https://creation.com/halleys-cometbeacon-of-creation>.

## Something to read from Science

On April 20<sup>th</sup> 1862 the first pasteurization test was completed by Louis Pasteur.

Louis Pasteur (1822-1895) was a French scientist who challenged the accepted scientific consensus of his day with results that have been of the lasting benefit to us all. His most ground breaking research focused on proving that life cannot arise “spontaneously” – that is on its own – it always comes from something living. In Pasteur's day scientists knew that decaying food does not literally turn into or breed the maggots that infested it. If meat, for instance, was covered up to prevent flies from laying their eggs on it there would be no maggots in it. However, they still thought that things too small to be seen by the unaided human eye could arise on their own. Pasteur devised an experiment that proved this was not the case. He had already discovered the existence of microbes from studying the processes which caused milk to go sour or wine to become bitter. He found out that fermentation only happened when microbes were present and that different microbes might produce different results.

To show that the idea of spontaneous generation of life was wrong, Pasteur boiled some broth which killed any microbes that might be in it. He had designed some special glass equipment that allowed air to circulate over the broth, but prevented microbes in the air from reaching the broth.



(Photo Credit: kgerow16[CC BY-SA 4.0 (<https://creativecommons.org/licenses/by-sa/4.0/>)])

As Pasteur expected, no microbes appeared in the broth. This proved that microbes were not spontaneously generated from the broth itself; they could *only* appear in the broth if they could get in contact with the air. “Microscopic beings must come into the world from parents similar to themselves,” he explained.

Now Pasteur was starting to understand how microbes behave. He wanted to make a practical application of what he knew. Much of the French economy depended on the production and export of wine. Wine spoiled by the action of microbes was a big loss for the economy of France. Pasteur modified the technique he had used with the broth. But he did not want to boil the wine because that would affect the flavour and make it unsaleable. Instead he heated it just enough to kill most of the microbes without spoiling the taste. It was not only wine that could be made to last longer by this process. Pasteur found that if milk was treated in this way most of the microbes were killed making the milk stay fresh longer but without affecting the taste.

In those days the disease tuberculosis was often carried in milk. Pasteurization, as Pasteur's idea was called, killed the tuberculosis germ. This made milk safe to drink without being boiled first. Pasteur did not patent this finding and become a rich man on the proceeds. Instead he made it freely available.

If you take some milk out of the fridge and look at the packaging you will probably find the word “pasteurized” on the carton or bottle.



Pasteur discovered that it was a round shaped living organism, yeast, that fermented wine. However, when wine was spoiled and vinegary Pasteur saw that under the microscope he could see a different rod shaped organism.

Not all microbes have harmful effects. Yoghurt, for instance, is made by the action of a microbe, the bacteria *Streptococcus thermophilus* and *Lactobacillus bulgaricus*. These bacteria eat the sugars in milk and produce lactic acid which makes milk proteins curdle. This makes the milk become thick yogurt.

Pasteur believed unswervingly that God had created the world and his findings should have been the end of the idea of “spontaneous generation”. However, spontaneous generation is an essential part of the theory of evolution, since without God, life must have arisen from non living material in the beginning. Louis Pasteur was a strong opponent of Darwin’s theory of evolution for this reason. Over the years Pasteur's work has continued to be proved correct: no spontaneous generation has ever been found. His experiments show that life could never have arisen on its own: life could never come from non-life.<sup>2</sup>

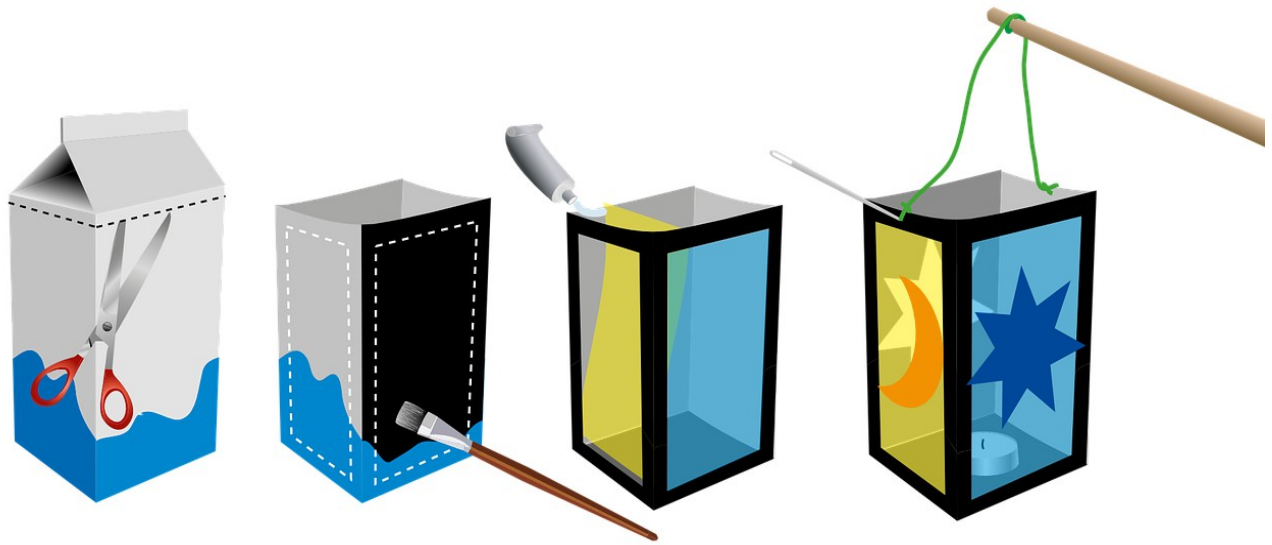
If you happen to own a microscope, it is possible to see the yoghurt bacteria for yourself.<sup>3</sup> If you do not have a microscope do not worry: you can still see the results of the activity of yogurt bacteria even though you cannot see the bacteria themselves by doing the delicious “experiment” in the Optional Resources file.

---

2 Older children can read more about Pasteur here: <https://creation.com/louis-pasteur>

3 For example you could follow these instructions: <https://www2.mrc-lmb.cam.ac.uk/microscopes4schools/yoghurt.php>

If you have your pasteurized milk in cartons here are two things you can do with the empty ones:



For the lantern you will need some black paint and some transparent or tissue paper and a tea-light. For the houses you would need some good thick poster paint or you could try an undercoat of proper decorating emulsion paint if you have some left over from decorating the house.



## Can you guess?

Thomas Döring is a librarian in the Special Collections division of the Library of the University of Leipzig. He specialises in early printed works. On 20<sup>th</sup> April 2006 he was waiting by a shelf in the library that contained Latin books. They dated from the early days of the Reformation and had been given to the Library by Leipzig's Thomaskirche (Church of St Thomas). Herr Döring was waiting for a colleague and as he waited he let his eye wander over the shelves. As he did so his gaze focused on a little book just 12.8cm by 7.5 cm. On the binding of the spine of the little book he could see what looked like a faint scrawl. He looked more closely. How strange! It was handwriting and obviously not Latin. He examined the little book carefully. It was a Latin book and it was printed. But the bookbinder had recycled an old piece of parchment to make the outer cover. The parchment was much older than the book and so was the writing on it.

Herr Döring consulted with his colleague, Dr. Falk Eisermann. They studied what they could see of the writing carefully and came to the conclusion that it was some kind of German language and obviously very old, much older than the book. Only a small part of the manuscript with its writing could be seen. To see the rest and work out what it said and what it was would mean taking the ancient and valuable book apart.

The two scholars decided to tell Prof. Dr. Hans Ulrich Schmid, Chair of Historical Linguistics at the University of Leipzig, what they had found.

As soon as he saw the old book with its even older binding Prof. Schmid was able to make some deductions. He could not see much of the manuscript, of course, but he could tell some important things from what he could see. The handwriting was in a style called Carolingian minuscule. This was used between 800AD and 1200 AD so that gave a rough, and very early, date to the manuscript. Prof. Schmid could see some alliteration in what was written. Alliteration is choosing words that begin with the same letter to make a poetic effect such as *Red Ridinghood* or *Wild Wales*. Then the Professor was able to distinguish some actual words: *sten* (stone), *idise* (women), and *giungarom* (disciples). Can you guess what part of what Bible story they had found? Find out the answer – and the rest of the mystery in the lesson for 25<sup>th</sup> April!